

REMARKS

The Office Action dated February 8, 2005 has been carefully considered. Claim 8 has been amended. Claims 8, 9, and 14 are in this application.

The drawings were objected to as including reference character 101 not mentioned in the description. The specification has been amended to include a reference to reference character 101. The drawings are objected to as including lead lines without a corresponding reference numeral or characters lacking lead lines to reference numerals mentioned in the specification. Applicants submit herewith Replacements Sheets 1 and 2 amending Figs. 2 and 3 to correct the lead lines.

Claim 8 has been amended. Support for amended claim 8 is found throughout the specification and in particular on page 13, lines 8-9. No new matter has been entered.

The specification was objected to as informal. The specification has been amended to provide correspondence between the lead lines of the figures and the specification. No new matter has been entered.

The previously presented claims 8, 9, 14 and 15 were rejected under 35 U.S.C. § 103 as obvious in view of admitted prior art shown in Fig. 1 and as described on page 1, line 15 through page 5 line 29 of the present specification in combination with U.S. Patent No. 4,769,998 to Oswalt et al. Applicants submit that the teachings of these references do not teach or suggest the invention defined by the present claims.

The Examiner states that in view of the admitted prior art, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a liquid coolant in the evaporator of the admitted prior art to prepare a chilled coolant and to use said liquid coolant in the evaporator in the apparatus for producing of acrylic acid or acrolein, as taught by Oswalt et al., for the purpose of improving operation efficiency, therefore said modification would merely amount to using an available coolant rather than a coolant which has to be prepared in auxiliary process. See page 5, lines 8-13 in the Office Action. However, the present invention is firstly characterized as an apparatus for production of acrylic acid or acrolein having a catalytic gas phase oxidation reactor. In contrast, Ostwalt et al. relates to water chillers and in particular to a system for providing precision control of process water temperatures over a broad range of loads.

Further, the present invention is secondly characterized by comprising items (a) through (e) in claims 8 and 14. Accordingly, the present invention belongs in the field of an apparatus for production of acrylic acid or acrolein. In contrast, Oswalt et al. which is used for rejecting the present invention is not in the field of an apparatus for production of acrylic acid or acrolein. In particular, Ostwalt et al. describe delivering chilled cooling water from a tank 5 to the load as shown in Fig. 1. The term "load" is typically described as some kind of equipment involved in a process such as an industrial laser machine, an injection molding machine for plastic. See col. 3, lines 24-29. Thus, the technology of Oswalt et al. relates to a mechanically refrigerated chiller system for a process coolant, but never teaches or suggests a process for acrylic acid or acrolein having a catalytic gas phase oxidation reactor and Oswalt et al. neither disclose nor suggest a method for producing acrylic acid and/or acrolein. In addition, Applicants submit that there is no motivation to combine Oswalt et al. directed to a precision-controlled water chiller with Applicants' admitted prior art directed to a process for producing acrylic acid and it is only in hindsight that the Examiner can choose features from Oswalt et al. for combination with Applicants' admitted prior art.

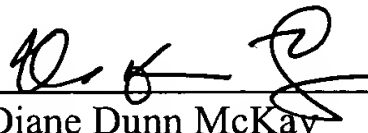
The Examiner states that the admitted prior art discloses that a coolant supplied to said evaporator is chilled by evaporating liquefied propylene and/or propane (Fig. 1). However, there is no teaching or suggestion of propylene and/or propane in Fig. 1. Rather, it is described that only water (col. 3, line 21) passes through the coils immersed in the process coolant in Oswalt et al. In the method for producing acrylic acid or acrolein by a catalytic gas phase oxidation, propylene and/or propane is used as a raw material of acrylic acid or acrolein generally and changed into acrylic acid and/or acrolein by the catalytic gas phase oxidation. Thus, the propylene and/or propane never circulate in the system because of changing into acrylic acid and/or acrolein by catalytic gas phase oxidation as described above. However, in Oswalt et al., a liquid passed through the coils immersed in the process coolant is circulated in the system. Accordingly, Oswalt et al. teach away from the present invention. Additionally, since the propylene and propane generates heat in the process during catalytic gas phase oxidation, if the Oswalt et al. system is to be used for producing acrylic acid or acrolein by catalytic phase oxidation, propylene and propane must be included in the "load" in Fig. 1.

Furthermore, there is no teaching or suggestion in the combination of the Applicants' admitted prior art or Oswald et al. that latent heat of the liquefied propylene and/or propane can be used in the acrylic acid process. Rather, in the apparatus of the admitted prior art, although there is provided the means for adjusting pressure 24, the evaporator 3 is heated by the steam 17. Thus, the steam 17 is not latent heat but is sensible heat. Further, in the apparatus of Applicants' admitted prior art, the latent heat of the liquefied propylene and/or propane in the acrylic acid process is wasted in the atmosphere. In contrast, in the present invention, the latent heat is used effectively for preparing a chilled coolant. There is no teaching or suggestion of this feature in either reference or the combination thereof. Instead, it is described that steam 17 is supplied to the evaporator for the purpose of utilizing the high energy of the steam, thereby gasifying liquefied propylene. Further, Oswald et al. do not teach or suggest chilling a coolant by recovering latent heat of the liquefied propylene and/or propane. Furthermore, there is no teaching or suggestion in the combination of the Applicants' admitted prior art or Oswald et al. that latent heat of the liquefied propylene and/or propane can be used for chilling a coolant. In addition, there is no teaching or suggestion in the combination of the Applicants' admitted prior art or Oswald et al. of means for adjusting pressure of the evaporator for gasifying liquefied propylene and/or propane in the range of about 0.2 to about 2 Mpa in gauge pressure. Accordingly, the invention defined by the present claims is not obvious in view of Applicants' admitted prior art in combination with Oswald et al.

In view of the foregoing, Applicants submit that all pending claims are in condition for allowance and request that all claims be allowed. The Examiner is invited to contact the undersigned should she believe that this would expedite prosecution of this application. It is believed that no fee is required. The Commissioner is authorized to charge any deficiency or credit any overpayment to Deposit Account No. 13-2165.

Respectfully submitted,

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